Appl. No.:   09/839,624
Amdt. dated June 3, 2004
Reply to Office action of March 9, 2004

REMARKS/ARGUMENTS

In the Office Action dated March 9, 2004, the Examiner: (1) objected to the specification; (2) objected to claim 7; (3) rejected claims 1-7 and 13 under 35 U.S.C. § 112, second paragraph; (4) rejected claims 1-7, 15-17 and 19-21 as anticipated by Rotenberg; (5) rejected claims 8-12 and 14 as obvious over Rotenberg in view of Tullsen; (6) rejected claim 13 as obvious over Rotenberg in view of Tullsen and Merchant; and (7) rejected claim 18 as obvious over Rotenberg in view of Merchant. In this Response, Applicant amends claims 1, 8, and 15. Based on the amendments and arguments contained herein, Applicant believes all pending claims to be in condition for allowance.

I.   SPECIFICATION OBJECTION

The requested specification amendments have been made. No new matter has been added.

II.   CLAIM 7 OBJECTION

The Examiner noted that claim 7 depends on claim 4, but that intervening claims 5 and 6 depend on claim 2. Per MPEP § 608.01(n), claim 7 should have been originally listed as claim 5. The Office Action requires Applicant to correct this issue. However, Applicant is not clear as to how to correct the issue. Accordingly, Applicant discussed this issue with the Examiner on May 27, 2004, the result of which is that no correction will be made to claim 7 and that the Examiner will likely drop the objection to claim 7.

III.   THE SECTION 112 REJECTIONS

The Examiner found an antecedent basis problem with claims 1 and 13. These problems have been corrected by way of amendment. The amendments in this regard do not narrow the scope of the claims.

IV.   ART REJECTIONS

The Examiner used Rotenberg in rejecting all pending claims. In section 1.2 Rotenberg discloses an "active" instruction stream (A-stream) and a "redundant" instruction stream (R-stream). The results of the A-stream are pushed onto a "delay buffer" (Figure 2). "As the R-stream is fetched and executed, its committed results are compared to those in the delay buffer. A fault

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is detected if the comparison fails.... . Rotenberg, first two paragraphs of section 1.2. Thus, the delay buffer in Rotenberg is used to check the results of the instructions in the A-stream and R-stream to detect the occurrence of errors. Rotenberg also discloses that the delay buffer is implemented as a First-In-First-Out ("FIFO") buffer and that the delay buffer is used to cause the R-stream to lag behind the A-stream. See end portion of section 1.4.

Applicant amends claim 1 in several regards. First, the "I/O controller" limitation has been removed as being unnecessary for patentability. This amendment naturally was not made to overcome any art of record nor does it narrow the scope of the claim. By removing the I/O controller reference, the claim is broadened in that respect.

Applicant amends claim 1 in another regard to overcome Rotenberg. Applicant amends claim 1 to specify that the processor comprises a "slack counter" and that the "the slack counter is used to cause instructions in the trailing thread to lag behind corresponding instructions in the leading thread." Rotenberg does not teach or even suggest the use of slack counter in this regard. At most, Rotenberg teaches a FIFO buffer (i.e., the delay buffer in Figure 2) to cause the R-stream to lag behind the A-stream. At least for this reason, claim 1 and its dependent claims are patentable over Rotenberg.

Applicant amends claim 8 to include "a counter that causes instructions in a copy of program thread to begin execution after corresponding instructions in another copy of the program thread begin execution." As explained above, Rotenberg does not teach or suggest the use of a counter in this regard. Tullsen does not satisfy the deficiency of Rotenberg. At least for this reason, claim 8 and its dependent claims are allowable.

Independent method claim 15 requires "implementing a counter to cause instructions in the leading thread to execute ahead of corresponding instructions in the trailing thread." As explained above, Rotenberg does not teach or suggest the use of a counter in this regard. At least for this reason, claim 15 and its dependent claims are allowable.

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V.   CONCLUSION

In the course of the foregoing discussions, Applicant may have at times referred to claim limitations in shorthand fashion, or may have focused on a particular claim element. This discussion should not be interpreted to mean that the other limitations can be ignored or dismissed. The claims must be viewed as a whole, and each limitation of the claims must be considered when determining the patentability of the claims. Moreover, it should be understood that there may be other distinctions between the claims and the cited art which have yet to be raised, but which may be raised in the future.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case. If any fees or time extensions are inadvertently omitted or if any fees have been overpaid, please appropriately charge or credit those fees to Hewlett-Packard Company Deposit Account Number 08-2025 and enter any time extension(s) necessary to prevent this case from being abandoned.

Respectfully submitted,

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